CLAIMS

We claim:

1. A method for statistical modeling and simulation of the impact of global variation and local mismatch on the performance of integrated circuits, comprising the steps of:

   a) estimating a representation of component mismatch from device performance measurements in a form suitable for circuit simulation;

   b) reducing the complexity of statistical simulation by performing a first level principal component or principal factor decomposition of global variation, including screening;

   c) further reducing the complexity of statistical simulation by performing a second level principal component decomposition including screening for each factor retained in step b to represent local mismatch; and

   d) performing statistical simulation with the joint representation of global variation and local mismatch obtained in step c.

2. A method of modeling and simulating the impact of local mismatch on performance of integrated circuits comprising the steps of:

   a) estimating a representation of component mismatch in a form suitable for circuit simulation from device performance measurements;

   b) reducing the complexity of statistical simulation by performing principal component or principal factor decomposition for local mismatch, including screening; and

c) performing statistical simulation with local mismatch obtained in step b.

3. The method of claim 2 where the principal component or principal factor decomposition is performed using eigenvalue eigenvector decomposition.

4. The method of claim 1 where the first principal component or principal factor decomposition is performed using eigenvalue eigenvector decomposition.

5. The method of claim 1 where the second principal component or principal factor decomposition is performed using eigenvalue-eigenvector decomposition.

6. A method for statistical modeling and simulation of the impact of global variation and local mismatch on the performance of integrated circuits, wherein said method is integrated in a statistical design and optimization computer-aided design tool to perform statistical simulation of joint and separate impact of global variation and local mismatch on performance of integrated circuits and said method comprises the steps of:

a) estimating a representation of component mismatch from device performance measurements in a form suitable for circuit simulation;

b) reducing the complexity of statistical simulation by performing a first level principal component or principal factor decomposition of global variation, including screening;

c) further reducing the complexity of statistical simulation by performing a second level principal component decomposition including screening for each factor retained in step b to represent local mismatch; and

d) performing statistical simulation with the joint representation of global variation and local mismatch obtained in step c.

7. A method of modeling and simulating the impact of local mismatch on performance of integrated circuits, wherein said method is integrated in a statistical design and optimization computer-aided design tool to perform statistical simulation of joint and separate impact of global variation and local mismatch on performance of integrated circuits and said method comprises the steps:

a) estimating a representation of component mismatch in a form suitable for circuit simulation from device performance measurements;

b) reducing the complexity of statistical simulation by performing principal component or principal factor decomposition for local mismatch, including screening; and

c) performing statistical simulation with local mismatch obtained in step b.

8. The method of claim 7 where the principal component or principal factor decomposition is performed using eigenvalue eigenvector decomposition.

9. The method of claim 6 where the first principal component or principal factor decomposition is performed using eigenvalue eigenvector decomposition.

10. The method of claim 6 where the second principal component or principal factor decomposition is performed using eigenvalue-eigenvector decomposition.